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Department of Mathematics
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FINAL SCIENTIFIC REPORT

Colorado State University
Fort Collins, Colorado
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U. S. Air Force
Contract F-49620-79-C-0124
DATA FITTING
1 July 1979 - 30 September 1981
Principal Investigator: G. D. Taylor

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During the above period the following articles written with grant support have been published or accepted for publication:

1. "Continuity of best reciprocal approximation on $[0, \infty)$ ", J.Approx.Theory, 30 (1980), 71-79 (co-authored with C. Dunham).
2. "Uniform approximation by rational functions having restricted denominators", accepted J.Approx.Theory (co-authored with E. Kaufman).
3. "On the existence of strong unicity of arbitrarily small order", Approximation Theory III, E.W.Cheney, ed., Academic Press, 1980, pgs 293-298 (co-authored with B.L.Chalmers).
4. "Uniform rational approximation by differential correction and Remes-differential correction", Int.J.for Numer.Meth.in Eng., 17 (1981), 1273-1280 (co-authored with E.Kaufman and D.Leeming).
5. "Copositive Rational Approximation", accepted J.Approx.Theory (co-authored with N.Seif).

The following manuscripts written with grant support have been submitted to technical journals for publication:

1. "A unified theory of strong uniqueness in uniform approximation with constraints", submitted to J.Approx.Theory (co-authored with B.L.Chalmers).
2. "Strong unicity of arbitrary rate", submitted to J.Approx.Theory (co-authored with B.Chalmers and F.Metcalf).
3. "An adaptive differential correction algorithm", submitted to J.Approx.Theory (co-authored with E.Kaufman and S.McCormick).

The following manuscripts representing research partially supported are currently being prepared for submission to technical journals:

1. "Reciprocal polynomial approximation subject to linear constraints", in preparation (with B.Chalmers, E.Kaufman, D.Leeming).
2. "Reciprocal polynomial approximation on $[0, \infty)$ with nonnegative coefficients", in preparation (with E.Kaufman and D.Leeming).

The following research projects receiving partial support have been completed.

1. Numerical testing of the uniform and restricted range adaptive curve fitting packages, M.S. Thesis, Colorado State University, Spring, 1980, written by James A. Pastoor, directed by Professor Taylor. Mr. Pastoor is currently employed at Hughes Aircraft Corporation, Denver.

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October 7, 1981

2. Numerical study of the sensitivity of the λ_1 - λ_2 adaptive curve fitting package, M.S. Thesis, Colorado State University, Spring, 1980, written by Jane E. Pastoor, directed by Professor Taylor. Mrs. Pastoor is currently employed at Hughes Aircraft Corporation, Denver.
3. Numerical testing of a curve-fitting package utilizing cubic splines, M.S. Thesis, Colorado State University, Summer, 1980, written by Roberta C. N. Okada, directed by Professor Taylor. Miss Okada is currently employed at Lockheed Aircraft Corporation, Sunnyvale, California.
4. An adaptive piecewise curve-fitting package using a look-ahead strategy, M.S. Thesis, Colorado State University, Spring, 1981, written by David C. Platt, directed by Professor Taylor. Mr. Platt is currently employed by Martin-Marietta Corporation, Denver, Colorado.
5. An adaptive application of a shape-preserving spline curve fitting routine, M.S. Thesis, Colorado State University, Summer, 1981, written by Chung-Chie George Chow, directed by Professor Taylor. Mr. Chow is currently employed by a small seismographic software company in Dallas, Texas.

The following two projects that received partial support from this contract are now being brought to completion:

1. Data fitting: a survey of existing data sets in the general literature. This will be the topic of a M.S. Thesis paper written by Eileen Fritz.
2. An adaptive application of a monotone preserving cubic spline package. This will be the topic of a M.S. Thesis paper written by Judy Lee.

Gerald D. Taylor,
Principal Investigator
~~██████████~~-F-49620-79-C-0124

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report lists articles written under support of the contract, which have been published or accepted for publication, manuscripts submitted to technical journals for publication, manuscripts currently being prepared for submission to technical journals, and research projects which received partial support and have been completed.		